

SURVEY OF ALLEGHENY RIVER, PENNSYLVANIA.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

With a letter from the Chief of Engineers, report of survey of Allegheny River, Pennsylvania.

JANUARY 27, 1896.—Referred to the Committee on Rivers and Harbors and ordered to be printed.

WAR DEPARTMENT,
Washington, D. C., January 24, 1896.

SIR: I have the honor to transmit herewith letter from the Chief of Engineers, dated January 22, 1896, together with a copy of a report from Maj. R. L. Hoxie, Corps of Engineers, dated December 9, 1895, of a survey made by him in compliance with the provisions of the river and harbor act of August 17, 1894, of Allegheny River, Pennsylvania.

Very respectfully,

DANIEL S. LAMONT,
Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., January 22, 1896.

SIR: I have the honor to submit the accompanying report of December 9, 1895, with two maps, by Maj. R. L. Hoxie, Corps of Engineers, of the results of survey of Allegheny River, Pennsylvania, for lock and dam at or near Tarentum, and lock and dam at the most practicable point for navigation between the proposed dam at Tarentum and Herr Island Dam, made to comply with provisions of the river and harbor act of August 17, 1894.

It is the opinion of Major Hoxie that slack-water navigation from the site of Herr Island Dam to Tarentum may be secured by the construc-

tion of two locks and dams, one just above the head of Six Mile Island, and the other at Springdale, at a cost of \$500,000.

Very respectfully, your obedient servant,

W. P. CRAIGHILL,
Brig. Gen., Chief of Engineers.

Hon. DANIEL S. LAMONT,
Secretary of War.

SURVEY OF ALLEGHENY RIVER, PENNSYLVANIA, FOR LOCK AND DAM AT OR NEAR TARENTUM, AND LOCK AND DAM AT THE MOST PRACTICABLE POINT FOR NAVIGATION BETWEEN THE PROPOSED DAM AT TARENTUM AND HERR ISLAND DAM.

UNITED STATES ENGINEER OFFICE,
Pittsburg, Pa., December 9, 1895.

GENERAL: I have the honor to submit the following report upon a survey of the Allegheny River, Pennsylvania, for lock and dam at or near Tarentum, and lock and dam at the most practicable point for navigation between the proposed dam at Tarentum and Herr Island Dam, made in conformity with instructions from the Chief of Engineers, and pursuant to section 12 of the river and harbor act of August 17, 1894.

The preliminary examination of this locality, made in 1892 pursuant to section 6 of the river and harbor act approved July 13, 1892, appeared to indicate that the technical requirements of the act of Congress could not be complied with, although in the report of this preliminary examination it is stated that the matter could be more intelligently discussed after proper survey of the locality. Such a survey having now been completed, it seems quite practicable to conform to the letter and spirit of the act.

The contemplation of the law appears to be that slack-water navigation shall be extended upon the Allegheny River from the site of Herr Island Dam, at the foot of Twenty-second street, in the city of Pittsburg, Pa., to the town of Tarentum, situated about 21 miles farther up the river, by the construction of two locks and dams. The site of one of these dams is approximately fixed in the act as "at or near Tarentum." The phrase "at or near" was doubtless intended to mean such location, more or less near to Tarentum, as might be required to pool the water of the river as far as the site of this town, and this interpretation of the law permits a compliance with the further and seemingly more imperative condition that the improvement should be completed by the construction of two locks and dams. Fortunately the conditions are such that both of these requirements may be complied with. A very careful survey and examination of the river between Herr Island Dam and Tarentum, together with detailed surveys at the sites which appeared to present the necessary conditions, gives the locations shown upon the accompanying maps, where, at reasonable cost, the works required for extending slack-water navigation from the Herr Island Dam to Tarentum may be constructed.

From the low-water surface of the Allegheny River at Tarentum to level of the Davis Island Pool at the site of Herr Island Dam the river has a fall of 26.9 feet; adding to this 3.1 feet required to give 6 feet depth of pool at Tarentum gives a total of 30 feet for the difference in elevation between Davis Island Pool and Pool No. 3, or Tarentum

Pool. Of this, 7 feet is overcome by the lift of Herr Island Dam, leaving 23 feet to be overcome by the two additional locks and dams. The Herr Island Pool gives 6 feet in the river channel to a point a little below the head of Six Mile Island, and the site selected for Dam No. 2, just above the head of the island, may be reached with this or a greater depth with the assistance of very little dredging of soft material at the upper end of the pool. Here a lift of 11 feet will give 6 feet depth in the channel of Pool No. 2 as far up as Springdale, where a desirable site is found for Dam No. 3. This site is 5 miles distant from Tarentum, and a lift of 12 feet gives a depth in the channel of 6 feet as far as and even some distance beyond the town of Tarentum. A small amount of dredging of soft material may be desirable at the head of Pools 2 and 3 to give proper width and depth of channel.

From experience in the construction of similar work upon the Allegheny and Monongahela rivers, and bearing in mind the necessity for deep foundations and strong construction of dams in the Allegheny River to resist the movement of great masses of ice and drift, and the deep scour occasioned by the lodgment of ice at the site of the dam, it is estimated that the cost of each lock and dam herein proposed will be about \$250,000, or a total of \$500,000 for extending slack-water navigation from the site of Herr Island Dam to Tarentum.

This survey was made by Mr. J. W. Arras, assistant engineer, whose report is transmitted herewith.

Very respectfully,

Brig. Gen. W. P. CRAIGHILL,
Chief of Engineers, U. S. A.

R. L. HOXIE,
Major of Engineers.

REPORT OF MR. J. W. ARRAS, ASSISTANT ENGINEER.

UNITED STATES ENGINEER OFFICE,
Pittsburg, Pa., November 4, 1895.

MAJOR: I have the honor to submit the following report upon survey for locks and dams in the Allegheny River, Pennsylvania:

Levels were run between Herr Island Dam, at the foot of Twenty-second street, Pittsburg, and the head of Tarentum Island, opposite the town of Tarentum, in order to determine the slope of the river and the fall to be overcome. This work was accomplished in October and November, 1894. It developed that the total difference between the elevation of the Davis Island Dam pool and that of the natural pool at Tarentum at low water is 26.9 feet. The elevation of the Davis Island Dam pool is 703 feet above mean ocean tide at Sandy Hook, and to create a 6-foot navigable pool at Tarentum it was ascertained that the water at that point must be raised to an elevation of 733, or 30 feet above the level of the Davis Island Dam pool. Deducting 7 feet, the proposed lift of the Herr Island Dam over the Davis Island Dam pool, there remain 23 feet to overcome in two lifts to effect a 6-foot navigation from Pittsburg to Tarentum. Lifts of 11 or 12 feet in fixed dams not being excessive, this was deemed entirely feasible, provided obstacles in the shape of low banks or islands were not encountered.

The low-water slope and elevations of the river bed suggested the foot of Six Mile Island and foot of Fourteen Mile Island as the proper locations for two dams of about equal lift to overcome the total of 23 feet. In order to determine the practicability of erecting and maintaining locks and dams on these locations preliminary hydrographic surveys were made, developing the heights of banks and islands, depth of water, character of river bed, etc. From the survey at the foot of Six Mile Island it was ascertained that the right bank, on which is situated the borough of Sharpsburg, with a population of several thousand, is too low to admit of the erection and maintenance of a fixed dam of a height of 11 feet above the level of the Herr Island Dam pool; also that Six Mile Island would, in the event of such a dam being constructed below it, be submerged on the occasion of every rise of even a few feet, thus destroying its value entirely for agricultural purposes.

Attention was next turned to the head of Six Mile Island as a prospective location. Here the banks were found to be amply high for the dam proposed, but to maintain a 6-foot navigation from the foot of the island to the lock it was found that some light dredging would probably become necessary. Owing to the presence of rock close to the surface of low water along the left bank, which the channel follows closely, a thorough examination of the river bed was made, developing the fact that no rock would be encountered in deepening the channel to 10 feet under Herr Island Dam pool level, if desirable. After completing the survey above the island it was deemed advisable to locate the lock and dam about 800 feet above the head, in order to avoid the heavy dredging necessary at the head of the island to secure a foundation for the dam, to prevent the washing away of the island by the spill over the dam, and because that location is more easy of access on both sides of the river. The channel being close to the left bank, the lock, which should be located on that side of the river, may be built entirely on a natural rock foundation.

A similar hydrographic survey was also made at the foot of Fourteen Mile Island, which developed the fact that a dam at that point raising the water 11.5 feet over the proposed Six Mile Island Dam pool would destroy, to a great extent, the value of the island for agricultural purposes, by causing it to overflow at every slight rise. Also considerable land on the right bank, opposite the head of the island, would be frequently submerged. An examination of the river at the head of the island was then made, where it was found that the left bank, along which the channel follows, and on which the lock must be located, was unstable and treacherous, the rock formation being very steep. The bank on the right was also found to be very low for a fixed dam of the height required here. However, the examination of this locality revealed the fact that the ridge at the head of Fourteen Mile Ripple is very short, and is not underlaid with rock such as would interfere with securing a navigable depth of 6 feet over it, and it was therefore decided to select for this lock and dam a location near the head of the pool above Fourteen Mile Island, known as Logans Eddy. Accordingly a survey was made opposite the village of Springdale, which site proved to be a favorable one for the erection and maintenance of a lock and dam. In this instance also it would be more desirable to locate the lock at the left bank, that being the deep-water or channel side of the river, and there being at least sufficient rock on which to erect the land wall.

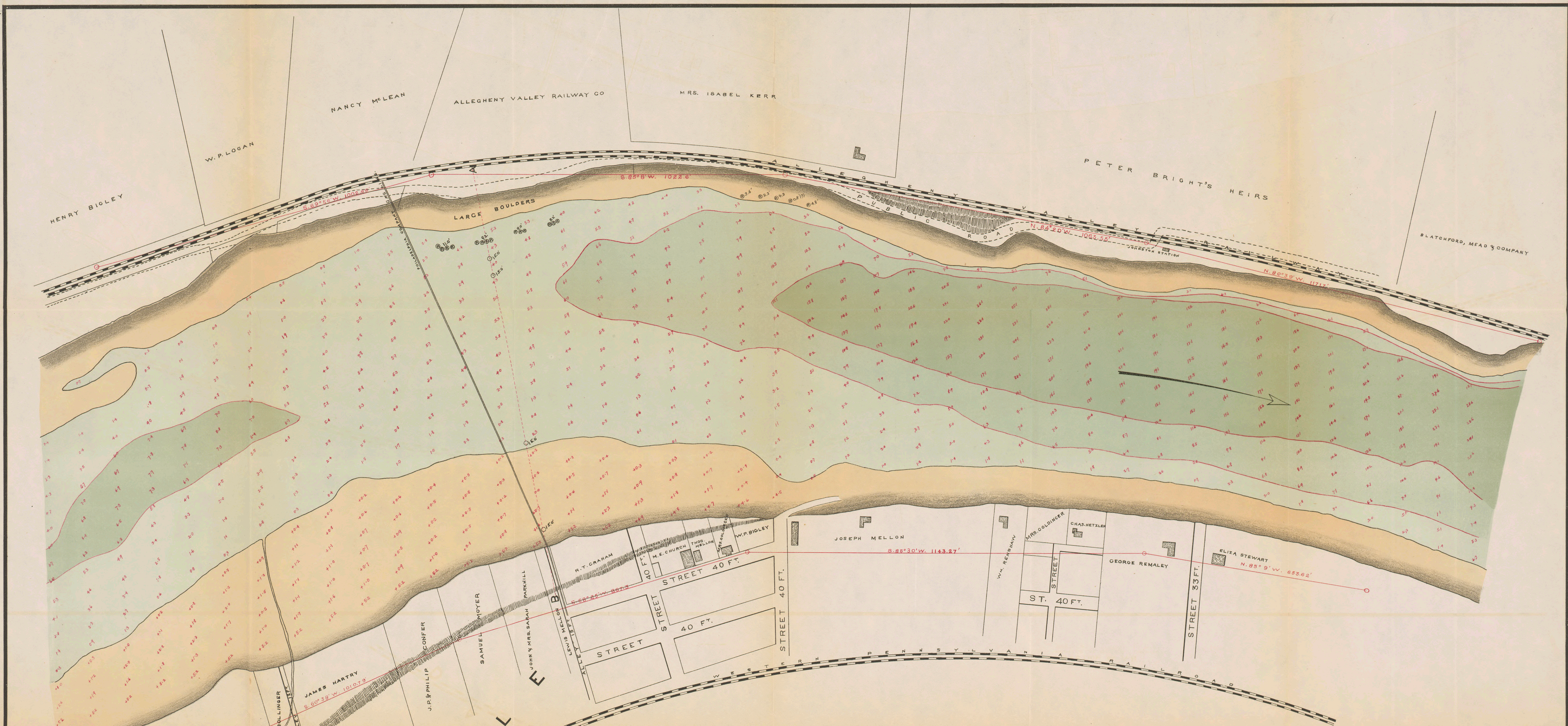
The location of the proposed Six Mile Dam is 5.1 miles above Herr Island Dam, and that of the proposed dam at Springdale 10 miles above the Six Mile Dam.

A map of each survey, showing the proposed locations of the dams, together with a profile showing the low-water slope, the heights and lifts of the first three dams in the Allegheny River, and the navigable depths of the pools, accompany this report.

Very respectfully, your obedient servant,

J. W. ARRAS, *Assistant Engineer.*

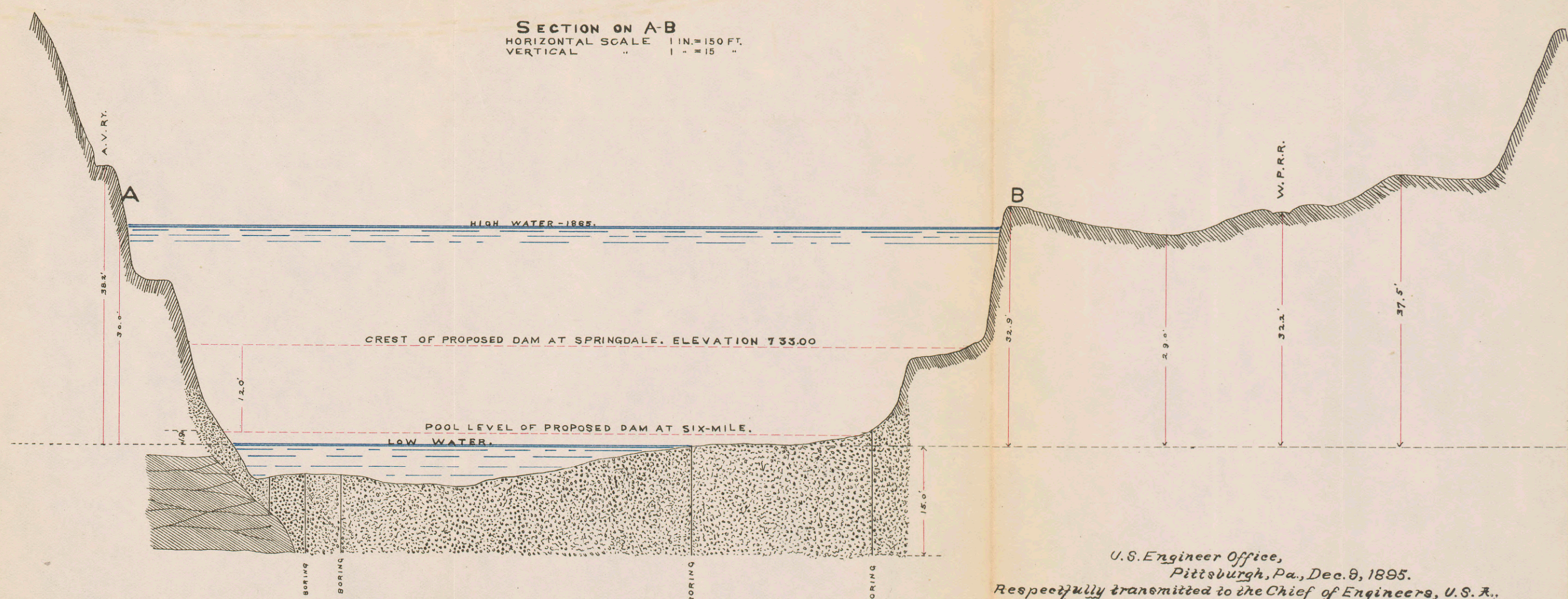
Maj. R. L. HOXIE,
Corps of Engineers, U. S. A.



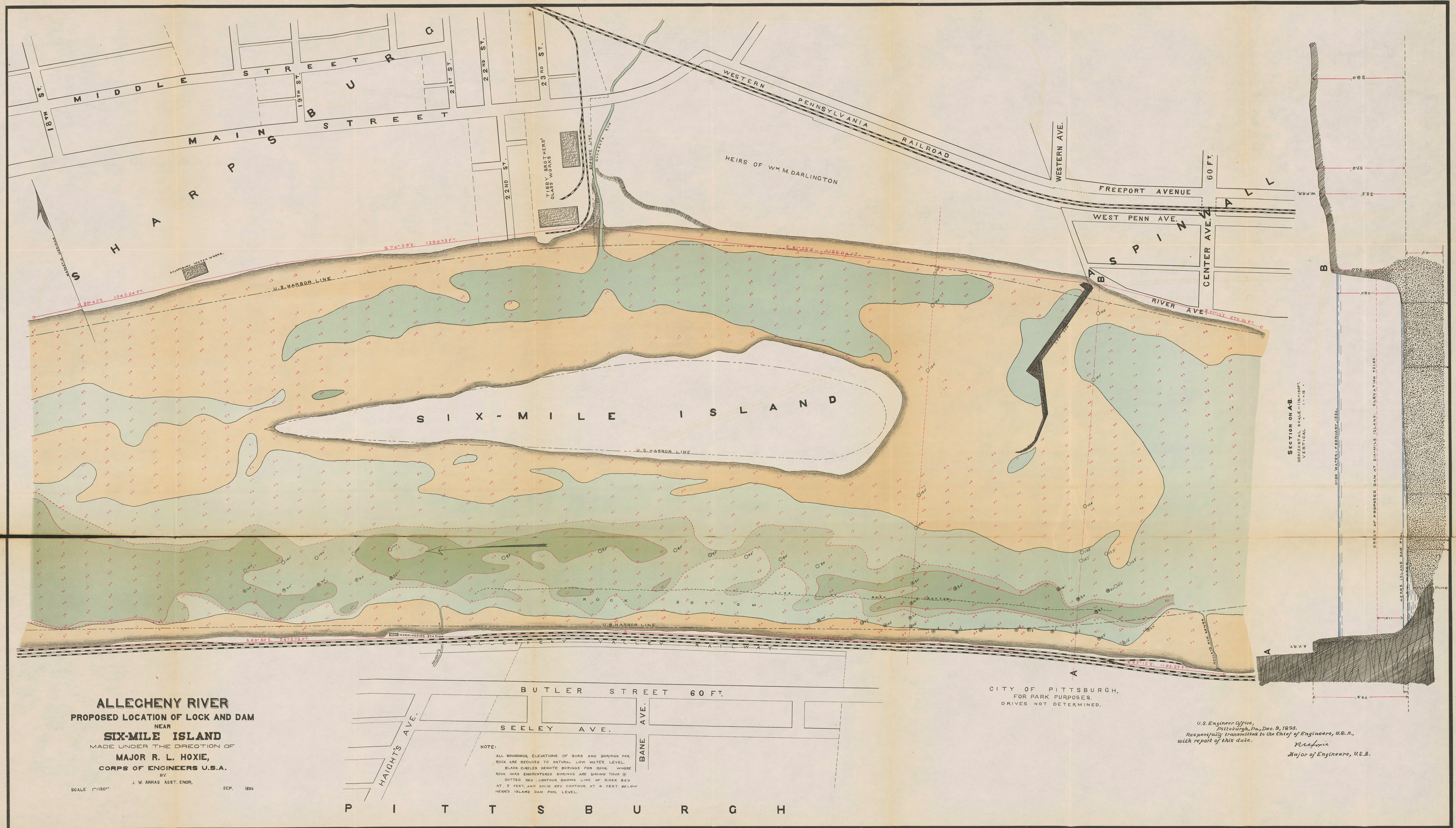
ALLEGHENY RIVER
PROPOSED LOCATION OF LOCK AND DAM
 NEAR
SPRINGDALE
 MADE UNDER THE DIRECTION OF
MAJOR R. L. HOXIE,
CORPS OF ENGINEERS U.S.A.

BY
 J. W. ARRAS, ASST. ENGR.
 SCALE 1"=150' SEP. 1895

NOTE:
 ALL SOUNDINGS, ELEVATIONS OF SHORES AND BORINGS FOR
 ROCK ARE REDUCED TO NATURAL LOW WATER LEVEL.
 BLACK CIRCLES DENOTE BORINGS FOR ROCK, WHERE ROCK
 WAS ENCOUNTERED BORINGS ARE SHOWN THUS ⊙



U.S. Engineer Office,
 Pittsburgh, Pa., Dec. 8, 1895.
 Respectfully transmitted to the Chief of Engineers, U.S.A.,
 with report of this date.
 W. H. Hoxie
 Major of Engineers, U.S.A.



U.S. Engineer Office,
Pittsburgh, Pa., Dec. 9, 1895.
Respectfully transmitted to the Chief of Engineers, U.S.A.,
with report of this date.
R. L. Hoxie
Major of Engineers, U.S.A.